

Investigation Skills and Reactions I

| Opportunities for Breadth and Challenge: Some pupils will partake in less structured practical tasks and receive less instruction than those who require further scaffolding | | | |
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| Links to Sequencing for Learning: This unit links to previous work on Scientific Investigations completed in KS2 (although knowledge and understanding will be very variable due to differing backgrounds) This unit prepares pupils for work in all years and disciplines to ensure that they are able to work safely and effectively to produce results in practical tasks. | | | |
| Section | What we are learning (Key knowledge) | Key words | Assessment |
| 1 | Working Safely in a Lab <ul style="list-style-type: none"> state how different hazards can cause risk explain how to perform an investigation safely | Hazard, Risk, Safety, Equipment | Prior knowledge and understanding |
| 2 | Scientific Equipment <ul style="list-style-type: none"> name and describe the use of scientific equipment select the correct scientific apparatus for an investigation | Bunsen burner, Tripod, Gauze, Heatproof Mat, Beaker | Prior knowledge retrieval |
| 3 | Using a Bunsen Burner <ul style="list-style-type: none"> describe and demonstrate the safe lighting of a Bunsen burner | Bunsen burner, Tripod, Gauze, Heatproof Mat, Splint | Homework, MUM: poster |
| 4 | Writing a Scientific Investigation <ul style="list-style-type: none"> devise a method to investigate a given research question correctly write up an investigation | Research, Hypothesis, Method, Results, Conclusion | Using method to produce results |
| 5 | Presenting Results <ul style="list-style-type: none"> present observations in tables produce graphs from data | Data, Table, Graph, Analysis | Production of accurately drawn tables and graphs |
| 6 | Chemical Reactions <ul style="list-style-type: none"> describe what happens to atoms in chemical reactions explain why chemical reactions are useful compare chemical reactions to physical changes | Reactant, Product, Reaction | Verbal explanation task |
| 7 | Word Equations <ul style="list-style-type: none"> identify reactants and products in word equations write word equations to represent chemical reactions identify decomposition reactions from word equations | Reactant, Product, Reaction | Ability to highlight products and reactants |

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| | <ul style="list-style-type: none">• use patterns to predict products of decomposition reactions | | To explain the meaning of a word equation |
| 8 | Revision | | Class assessment sheet |
| 9 | End of Unit Test | | EUT |
| 10 | Test Feedback | | Test feedback sheet |

Particles, Elements and Atoms: Substances and Separating Techniques

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| Section | What we are learning (Key knowledge) | Key words | Assessment |
|---------|---|--|---|
| 1 | Particles <ul style="list-style-type: none"> describe how materials are made up of particles | Particle, Atom, Combine | Verbal discussion task |
| 2 | States of Matter and Changes of State <ul style="list-style-type: none"> explain the properties of a substance in its three states use ideas about particles to explain the properties of a substance in its three states interpret data about melting points and changes of state select data and information about boiling points and use them to contribute to conclusions describe changes of state involving gases define particle, mixture, substance, solid, liquid, gas, states of matter, melting, freezing, boiling, freezing, condensation, gas pressure | Solid, Liquid, Gas, Energy, Movement | Production of diagram independently, self assessed |
| 3 | Atoms, Elements and Compounds <ul style="list-style-type: none"> state what elements, atoms and compounds are | Atom, Element, Compound, Pure, Impure | Definition recall |
| 4 | Mixtures <ul style="list-style-type: none"> describe particle arrangements in mixtures explain how to identify pure substances describe solutions using key words use the particle model to explain dissolving explain what a saturated solution is explain the meaning of solubility | Pure, Impure, Soluble, Solution | Explanation of diagram |
| 5 | Separating Rock Salt <ul style="list-style-type: none"> explain how filtration works describe how to filter a mixture | Soluble, Insoluble, Evaporate, Crystallise | Successful completion of practical activity to produce good results |

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| | <ul style="list-style-type: none"> explain how to use evaporation to separate mixtures | | MUM- Complete method |
| 6 | Distillation <ul style="list-style-type: none"> explain how distillation works | Distillation, Evaporation, Soluble, Liebig condenser | Explanation of diagram |
| 7 | Chromatography <ul style="list-style-type: none"> explain how chromatography separates mixtures analyse chromatograms to identify substances in mixtures | Chromatogram, Soluble, Capillary Effect | Exam style questions following practical |
| 8 | Revision | | Class assessment sheet |
| 9 | End of Unit Test | | EUT |
| 10 | Test Feedback | | Test feedback sheet |

The Periodic Table

Opportunities for Breadth and Challenge:

Some pupils will explain the development, uses and application of the Periodic Table at varying depths, and investigate different elements and their uses

Links to Sequencing for Learning:

This unit links to previous work on Atoms, Elements, Compounds and Mixtures, as well as any previous study of the periodic table. Additionally, it builds upon Materials and their Properties covered in KS2

This unit prepares pupils for work in all years and disciplines to ensure that they are able to work safely and effectively to produce results in practical tasks.

| Section | What we are learning (Key knowledge) | Key words | Assessment |
|---------|---|---|---|
| 1 | The Periodic Table <ul style="list-style-type: none"> • recall the chemical symbols of six elements • record observations and data on elements • compare the properties of one atom of an element to the properties of many atoms • interpret observations and data • understand and use Scientific chemical names • define element, periodic table, chemical symbol, atom, compound, molecule and chemical formula | Element, Chemical Symbol, Atom, Compound, Molecule | Low stakes definition recall |
| 2 | Metals and Non-Metals <ul style="list-style-type: none"> • explain how elements are classified as metals and non-metals • use patterns to classify an element as a metal or non-metal | Property, Metallic, Conductor, Insulator, Electricity | Key word explanations |
| 3 | The Elements of Group 1 <ul style="list-style-type: none"> • use patterns to predict the properties of elements • compare patterns in properties in the groups and periods of the Periodic Table • interpret data to describe patterns in properties of Group 1 elements | Alkali Metal, Property, Reactivity, Volatile, Effervescence | Homework, MUM: poster |
| 4 | The Elements of Group 7 <ul style="list-style-type: none"> • use patterns to predict properties of Group 7 elements | Halogen, Toxic, Reactive, Halide | Justification of predictions |
| 5 | The Elements of Group 7 and Displacement <ul style="list-style-type: none"> • describe displacement reactions | Displace, Reactive, Compound | Comic strip to explain distillation through modelling |

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| 6 | <p>The Transition Elements</p> <ul style="list-style-type: none"> state the position of the transition elements on the Periodic Table describe the uses of transition elements | Catalyst, Melting, Boiling, Conduction | Top trumps |
| 7 | <p>The Elements of Group 0</p> <ul style="list-style-type: none"> describe the physical and chemical properties of Group 0 elements use patterns to predict properties of Group 0 elements | Noble Gases, Inert, Unreactive, Stable | Data task |
| 8 | Revision | | Class assessment sheet |
| 9 | End of Unit Test | | EUT |
| 10 | Test Feedback | | Test feedback sheet |